Objective: Cord blood stem cells are routinely used in transplant for hematological malignancies. Many nonmalignant disorders, particularly genetic disorders, require allogeneic transplantation, but autologous transplantation is also possible. This report documents 17 cord blood units (CBU) released by one bank for treatment of nonmalignant hematopoietic disorders. **Methods:** Cord blood was collected from the umbilical cord of consenting mothers who elected to store CBU, however, directed donation was offered to families with an individual diagnosed with a disease treatable with stem cells. The whole blood product was processed at the Cord Blood Registry laboratory in Tucson, AZ to separate mononuclear cells (MNC) from red blood cells and non-engrafting cells. The processed CBU were cryopreserved until requested for use. Prior to release, viability and HLA were assessed. **Results:** Of 56 CBU released for transplant, 17 (30.4%) were for nonmalignant disorders: 3 thalassemia, 2 Fanconi anemia, 1 Hurler syndrome, 2 sickle cell anemia, 6 aplastic anemia, 1 x-linked hyper IGM syndrome, 1 Diamond Blackfan anemia, and 1 Wolman disease. 13 (76.5%) of 17 were from a sibling, but 4 aplastic anemia transplants were autologous. The 17 samples were stored a mean of 28.38 months (range: 2–114), mean patient age was 5.4 years, and mean period of engraftment was 18.94 days (range: 2–36), with a mean of 0.77% CD34+ cells. All units were viable for transplant. The patient with Wolman disease died 17 days post-transplant due to unrelated complications, engraftment was not evaluable. Conclusion: Cord blood stem cells are increasingly common for patients with nonmalignant blood and marrow disorders, and the availability of sibling cord blood decreases risk of transplant-related morbidity and mortality. Nonmalignant disorders represent a third of all transplants facilitated by this family bank, suggesting that they are a significant indication for cord blood transplantation. Directed donation or private banking should be considered for siblings of patients with a nonmalignant disorder treatable with stem cells.

Diagnosis	Donor Relationship	Recipient Age (yrs)	Time Stored (months)	Engraftment time PMN > 500 (days)	Status
Beta Thalassemia	Sibling	3.3	5	17	Cured
Fanconi Anemia	Sibling	5.0	12	24	Cured
Hurler Syndrome	Sibling	2.6	2	12	Deceased - organ failure; cardiomyopathy
Sickle Cell Anemia	Sibling	9.8	29	23	Cured
Aplastic Anemia	Auto	2.7	32	36	Deceased - infection; aspergillus
Sickle Cell Anemia	Sibling	2.4	2	35	Cured
Beta Thalassemia	Sibling	7.1	5	13	Cured
X-linked Hyper IGM Syndrome	Sibling	3.1	7	14	Unknown
Fanconi Anemia	Sibling	11.5	27	13	Deceased - hemorrhage post-liver biopsy
Aplastic Anemia	Auto	3.0	36	2	Remission
Aplastic Anemia	Sibling	2.9	6	27	Remission
Beta Thalassemia	Sibling	0.3	44	16	Cured
Aplastic Anemia	Auto	4.9	58	29	Relapsed
Aplastic Anemia	Auto	9.6	114	21	Remission
Aplastic Anemia	Sibling	5.3	24	7	Remission
Diamond Blackfan Anemia	Sibling	10.1	24	14	Cured
Wolman Disease	Sibling	0.2	27	Unevaluable	Deceased - respiratory failure

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ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT) FOR HEMATOLOGIC MALIGNANCIES AFTER REDUCED INTENSITY CONDITIONING (RIC) IN CHILDREN AND YOUNG ADULTS

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RIC regimens and allogeneic HSCT are used to treat adults with malignancies, relying on cellular graft-vs-malignancy effects. Age or co-morbid conditions do not preclude treatment. RIC regimens could potentially reduce long-term morbidity, enhancing the quality of life in pediatric survivors of HSCT.

We report the experience of 44 RIC HSCT for children/young adult patients (pts) with hematologic malignancies, 33 at high-risk for complications of full-intensity conditioning due to disease state, prior HSCT (5 allo, 7 auto) and/or co-morbidities. The RIC regimen was comprised of fludarabine, 150 mg/m^2 over 5 days, followed by IV busulfan, 0.8–1 mg/kg for 8 doses (n = 14) or targeted AUC 4000 microMol*min for 2 doses (n = 30) and ATG. 10 pts received extracorporeal photopheresis (ECP), and not ATG.

Diagnoses included: ALL (18, ≥CR3 in 9), AML (9, refractory in 3), CML (6), Non-Hodgkin's Lymphoma (5), Hodgkin's Lymphoma (2) or treatment-related myelodysplastic syndrome (4). There were 26 males, 18 females, ages 2–21 yrs, median 11. Stem cell sources included 22 unrelated donors (URD), 20 matched sibs and 2 mis-matched relatives. 42 of 44 stem cell donations were mobilized peripheral blood. Graft-versus-host disease (GVHD) prophylaxis was cyclosporin A (CsA) alone in 11 pts, CsA and mycophenolate (MMF) in 24 pts or CsA with MMF and post-HSCT ECP in 9 patients.

The median time to reach an ANC >500/mcl was 19 days (range 9–62). An unsupported Plt Ct > 20,000/mcl was achieved in 40 pts at a median of 17 days (7–228), 14 pts required no platelet support. 2 pts with URD failed to engraft and 2 had graft loss. 8 pts developed Gr III-IV acute GVHD, 11 of the 34 pts surviving more than 100 days developed chronic GVHD (5 limited, 6 extensive). Sustained full (>95%) donor chimerism was achieved in 24 pts.

13 pts survive without disease relapse or progression. 22 pts relapsed or had molecular evidence of persistent disease. Of these, 3 pts are alive in subsequent remission following immune modulation, 5 are in remission after further therapy (4 HSCT) and 5 continue therapy. 9 pts died after disease recurrence. Another 9 pts have died, 7 from opportunistic infections, 2 from hyperacute GVHD. Thus, the projected 3-year survival in this very high-risk group of pts is 44%.

Our results suggest a graft vs malignancy effect can be harnessed and RIC allogeneic HSCT should be considered for pediatric pts, especially those at high-risk for complications after conventional HSCT.

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HAPLOIDENTICAL STEM CELL TRANSPLANTATION USING T- AND B-LYMPHOCYTE DEPLETED GRAFTS FOLLOWING REDUCED INTENSITY CONDITIONING FOR WISKOTT-ALDRICH SYNDROME

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Wiskott - Aldrich syndrome (WAS) is a rare X-linked syndrome characterized by micro- thrombocytopenia, eczema, and immunodeficiency, curable only through allogeneic hematopoietic stem cell transplantation (HSCT). A mismatched family member is an option when no matched related or unrelated donor is available. Our team recently treated two young males, ages 1 year and 4 years, who were enrolled on a prospective clinical trial using haploidentical HSCT for WAS. One donor was a 3/6 HLA-matched mother and the other a 4/6-HLA matched father. A reduced intensity conditioning (RIC) regimen consisting of fludarabine, thiotepa, melphalan and OKT3 was administered. To reduce the risk of severe graft-versus-host disease (GVHD) and EBV-lymphoma (PTLPD), patients received a G-CSF mobilized peripheral blood stem cell product depleted of T- and B-lymphocytes using the CliniMACS. To facilitate engraftment, 1–2.5 × 10^5 CD3$^+$ cells/kg were added to the graft. Cyclosporine was initiated on day -2 and continued until day +100, then tapered in the absence of GVHD. The length of hospitalization was 26 and 44 days. They received grafts containing between 7.9–25.95 × 10^6 CD34$^+$ cells/kg and received 1.6–3.3 × 10^4 CD19$^+$ cells/kg. Both demonstrated myeloid engraftment on days 10 and 11 and achieved platelet engraftment of 50,000/mm^3 by days 13 and 15. Only one patient, the one who received the lower T-cell dose, experienced GHVD; he had grade 1 acute GHVD,